WHAT IS CLAIMED IS:

1. An apparatus comprising:

an implantable housing, the implantable housing comprising:

a thoracic monitor circuit, including an output to provide time domain thoracic information; and

a signal processor circuit, the signal processor circuit comprising:

a time-to-frequency domain converter circuit, including an input coupled to the thoracic monitor circuit output to receive the time domain thoracic information, and including an output providing frequency domain thoracic information; and

a spectrum analyzer circuit, including a input coupled to the time-to-frequency domain converter circuit output to receive the frequency domain thoracic information, and including an output to provide a classification of a pulmonary physiological state using a respiration component of the frequency-domain thoracic information.

2. The apparatus of claim **1**, in which the thoracic monitor circuit comprises an impedance detector circuit.

3. The apparatus of claim **2**, in which the impedance detector circuit comprises:

a test stimulus circuit, configured to be coupled to a subject using implantable electrodes to deliver a test stimulus to the subject; and

a response sensing circuit, configured to be coupled to the subject using implantable electrodes to receive a signal correlative to transthoracic impedance in the subject in response to the test stimulus delivered to the subject.

4. The apparatus of claim **1**, in which the thoracic monitor circuit comprises an acceleration detector circuit.

5. The apparatus of claim **1**, in which the thoracic monitor circuit comprises an analog-to-digital (A/D) converter circuit.

6. The apparatus of claim **1**, in which the time-to-frequency domain converter circuit comprises a fast-Fourier transform (FFT) module.

7. The apparatus of claim **1**, further comprising:

a controller circuit, the controller circuit comprising an input coupled to the spectrum analyzer output to receive the pulmonary physiological state classification; and

a therapy circuit, coupled to the controller circuit, to deliver therapy to the subject using the pulmonary physiological state classification.

8. The apparatus of claim **1**, further including a telemetry circuit, coupled to the output of the spectrum analyzer to receive the pulmonary physiological state classification for communication from the implantable housing.

9. The apparatus of claim **1**, in which the spectrum analyzer is configured to compute a physiological indicator using a heart rate variability (HRV) component of the frequency-domain thoracic information.

10. The apparatus of claim **1**, further comprising a frequency domain adaptive filter, the frequency domain adaptive filter comprising a first input coupled to the output of the time-to-frequency domain converter circuit, the frequency domain

adaptive filter also comprising an output coupled to the input of the spectrum analyzer.

11. The apparatus of claim **10**, further comprising:

a depolarization detector circuit; and

a heart rate interval timer circuit, coupled to the depolarization detector circuit, the heart rate interval timer circuit including an output coupled to a second input of the frequency domain adaptive filter.

12. The apparatus of claim **1**, in which the signal processor circuit includes a digital signal processor (DSP) circuit.

13. An apparatus comprising:

an implantable housing, the implantable housing comprising:

a thoracic monitor circuit, including an output to provide time domain thoracic information; and

a signal processor circuit, the signal processor circuit comprising:

a time-to-frequency domain converter circuit, including an input coupled to the thoracic monitor circuit output to receive the time domain thoracic information, and including an output providing frequency domain thoracic information; and

a frequency domain adaptive filter, the frequency domain adaptive filter including a first input coupled to the output of the time-to-frequency domain converter circuit, the frequency domain adaptive filter including a second input to receive a time domain heart rate signal, the frequency domain adaptive filter configured to distinguish a respiration component of the frequency domain thoracic

information from a heart contraction component of the frequency domain thoracic information.

14. The apparatus of claim **13**, in which the thoracic monitor circuit comprises an impedance detector circuit.

15. The apparatus of claim **14**, in which the impedance detector circuit comprises:

a test stimulus circuit, configured to be coupled to a subject using implantable electrodes to deliver a test stimulus to the subject; and

a response sensing circuit, configured to be coupled to the subject using implantable electrodes to receive a signal correlative to transthoracic impedance in the subject in response to the test stimulus delivered to the subject.

16. The apparatus of claim **13**, in which the thoracic monitor circuit comprises an acceleration detector circuit.

17. The apparatus of claim **13**, in which the thoracic monitor circuit comprises an analog-to-digital (A/D) converter circuit.

18. The apparatus of claim **13**, in which the time-to-frequency domain converter circuit comprises a fast-Fourier transform (FFT) module.

19. The apparatus of claim **13**, in which the signal processor circuit comprises a spectrum analyzer circuit, the spectrum analyzer circuit including a input coupled to the time-to-frequency domain converter circuit output to receive the frequency domain thoracic information, and the spectrum analyzer including an output to

provide a classification of a pulmonary physiological state using a respiration component of the frequency-domain thoracic information.

20. The apparatus of claim **19**, further comprising:

a controller circuit, the controller circuit including an input coupled to the spectrum analyzer output to receive the pulmonary physiological state classification; and

a therapy circuit, coupled to the controller circuit, to deliver therapy to the subject using the pulmonary physiological state classification.

21. The apparatus of claim **19**, further comprising a telemetry circuit, coupled to the output of the spectrum analyzer to receive the pulmonary physiological state classification for communication from the implantable housing.

22. The apparatus of claim **19**, in which the spectrum analyzer computes a physiological indicator using a heart rate variability (HRV) component of the frequency-domain thoracic information.

23. The apparatus of claim **13**, further comprising:

a depolarization detector circuit; and

a heart rate interval timer circuit, coupled to the depolarization detector circuit, the heart rate interval timer circuit including an output coupled to a second input of the frequency domain adaptive filter.

24. The apparatus of claim **13**, in which the signal processor circuit includes a digital signal processor (DSP) circuit.

25. A method comprising:

detecting a time domain thoracic signal using an implanted device;

transforming the time domain thoracic signal into a frequency-domain thoracic signal;

filtering the frequency domain thoracic signal in the frequency domain to obtain frequency domain respiration information; and

classifying a pulmonary physiological state using the frequency domain respiration information

26. The method of claim **25**, in which the detecting the time domain thoracic signal comprises detecting an impedance.

27. The method of claim **25**, in which the detecting the time domain thoracic signal comprises detecting an acceleration.

28. The method of claim **25**, in which the transforming the time domain thoracic signal comprises using the implanted device.

29. The method of claim **25**, in which the filtering comprises using the implanted device.

30. The method of claim **25**, in which the classifying a pulmonary physiological state includes using the implanted device.

31. The method of claim **25**, in which the transforming the time domain thoracic signal comprises performing a fast Fourier transform (FFT).

32. The method of claim **25**, in which the classifying the pulmonary physiological state includes classifying the pulmonary physiological state as indicative of normal respiration.

33. The method of claim **25**, in which the classifying the pulmonary physiological state includes classifying the pulmonary physiological state as indicative of periodic respiration.

34. The method of claim **25**, in which the classifying the pulmonary physiological state includes classifying the pulmonary physiological state as indicative of Cheyne-Stokes respiration.

35. The method of claim **25**, in which the classifying the pulmonary physiological state includes classifying the pulmonary physiological state as indicative of obstructed respiration.

36. The method of claim **25**, in which the classifying the pulmonary physiological state includes classifying the pulmonary physiological state as indicative of restrictive respiration.

37. The method of claim **25**, in which the classifying the pulmonary physiological state includes classifying the pulmonary physiological state as indicative of pulmonary fluid accumulation.

38. The method of claim **25**, further comprising communicating information about the pulmonary physiological state from the subject to a remote interface.

39. The method of claim **38**, further comprising storing the pulmonary physiological state for a predetermined time in a non-implanted memory.

40. The method of claim **39**, further comprising displaying a trend of stored pulmonary physiological states.

41. A method comprising:

detecting a time domain thoracic signal using an implanted device;

detecting a heart rate;

transforming the time domain thoracic signal into a frequency domain thoracic signal; and

filtering the frequency domain thoracic signal in the frequency domain using a cutoff frequency that varies as a function of the detected heart rate.

42. The method of claim **41**, in which the detecting the time domain thoracic signal includes detecting an impedance signal.

43. The method of claim **41**, in which the detecting the time domain thoracic signal includes detecting an acceleration signal.

44. The method of claim **41**, in which the transforming the time domain thoracic signal comprises performing a fast Fourier transform (FFT).

45. The method of claim **41**, in which the filtering includes extracting heart rate contraction information from the frequency domain thoracic signal.

46. The method of claim **41**, in which the filtering includes extracting respiration information from the frequency domain thoracic signal.

47. The method of claim **46**, further comprising classifying a pulmonary physiological state using the respiration information.

48. The method of claim **47**, in which the classifying the pulmonary physiological state includes classifying the pulmonary physiological state as indicative of normal respiration.

49. The method of claim **47**, in which the classifying the pulmonary physiological state includes classifying the pulmonary physiological state as indicative of periodic respiration.

50. The method of claim **47**, in which the classifying the pulmonary physiological state includes classifying the pulmonary physiological state as indicative of Cheyne-Stokes respiration.

51. The method of claim **47**, in which the classifying the pulmonary physiological state includes classifying the pulmonary physiological state as indicative of obstructed respiration.

52. The method of claim **47**, in which the classifying the pulmonary physiological state includes classifying the pulmonary physiological state as indicative of restrictive respiration.

53. The method of claim **47**, in which the classifying the pulmonary physiological state includes classifying the pulmonary physiological state as indicative of pulmonary fluid accumulation.

54. The method of claim **47**, further comprising communicating information about the pulmonary physiological state from within the subject to a remote interface.